Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) An organic solvent-based photothermographic material comprising a support having thereon, one or more imaging layers comprising a hydrophobic binder and:

a. a photosensitive silver halide,

b. in reactive association with said photosensitive silver halide, a non-photosensitive source of reducible silver ions,

c. a reducing agent for said reducible silver ions,

e. an aliphatic or non-aromatic carbocyclic polycarboxylic acid that is present in an amount of from about 0.0004 to about 0.01 mol/mol of total silver, and,

d. optionally, an X-radiation-sensitive phosphor.

2. (original) The material of claim 1 wherein said aliphatic or non-aromatic carbocyclic polycarboxylic acid is represented by the following Structure (VIII):

HOOC-L-COOH

(VIII)

wherein L represents a direct bond or a substituted or unsubstituted aliphatic linking group consisting of 1 or 2 carbon atoms.

3. (original) The material of claim 1 wherein said aliphatic or non-aromatic carbocyclic polycarboxylic acid has three or more carboxylic acid groups.

4. (original) The material of claim 1 wherein said aliphatic or non-aromatic carbocyclic polycarboxylic acid is one or more of citric acid, tartaric acid, maleic acid, fumaric acid, succinic acid, oxalic acid, malonic acid, malic acid, citraconic acid, mesaconic acid, malonic acid, tricarballylic acid, 1,2,3,4-butanetetracarboxylic acid, 1,2,3,4-cyclopentanetetracarboxylic acid, 1,3,5-cyclohexanetricarboxylic acid, and 1,2-cyclohexanedicarboxylic acid.

5. (original) The material of claim 4 wherein said aliphatic or non-aromatic carbocyclic polycarboxylic acid is citric acid, tricarballylic acid, 1,2,3,4-butanetetracarboxylic acid, 1,2,3,4-cyclopentanetetracarboxylic acid, and mixtures of these.

6. (original) The material of claim 1 wherein the total silver coverage is at least 0.002 mol/m^2 and said aliphatic or non-aromatic carbocyclic polycarboxylic acid is present in an amount of from about 0.001 to about 0.004 mol/mol of total silver.

7. (original) The material of claim 1 comprising a cerium activated rare earth phosphate or a cerium activated yttrium phosphate as said X-radiation-sensitive phosphor, said X-radiation-sensitive phosphor having a zircon or monazite crystal structure.

8. (currently amended) The material of claim 1 ~~8~~ comprising a europium activated strontium fluoroborate having a composition defined from the following Structure (IV) as said X-radiation-sensitive phosphor:

$$M_aF_bB_cO_d:eEu$$

(IV)

wherein M is strontium, or a mixture of metals containing strontium and one or more of the metals Mg or Ca, F is fluoride, B is boron, O is oxygen, $0 < a \leq 1.5$, $0 < b \leq 0.5$, $2 < c \leq 5$, $3 < d \leq 7$, $0 < e \leq 0.25$, and $0 < a + e \leq 2$.

9. (original) The material of claim 1 comprising a strontium phosphate having a composition defined by the following Structure (V) as said X-radiation-sensitive phosphor:

$$M^1_{a1}M^2_{b1}M^3_{c1}P_{d1}O_{e1}$$

(V)

wherein M^1 and M^2 are different metals selected from the group consisting of Mg, Ca, Sr, and Zn, M^3 is one or more of the metals Eu, Mn, Sn, and Pb, $0 < a1 \leq 2$, $0 < b1 \leq 1$, $0 < c1 \leq 0.2$, $0 < a1 + b1 + c1 \leq 2$, $0 < d1 \leq 4$, and $0 < e1 \leq 10$.

10. (original) The material of claim 1 comprising a cerium and strontium activated rare earth phosphate or a cerium and strontium activated yttrium phosphate having a composition defined by the following Structure (VI) as said X-radiation-sensitive phosphor:

$$M^1_{a2}M^2_{b2}M^3_{c2}M^4_{d2}P_{e2}O_f$$

(VI)

wherein M^1 is lanthanum or yttrium, M^2 is cerium, M^3 is gadolinium, ytterbium, or a mixture thereof, M^4 is strontium or a strontium containing a mixture of alkaline earth metals, $0 < a2 \leq 1$, $0 < b2 \leq 0.6$, $0 < c2 \leq 0.5$, $0 < d2 \leq 0.1$, $0 < a2 + b2 + c2 + d2 \leq (e2 + 1)$, and $0 < f \leq (4.5e2)$.

11. (original) The material of claim 1 wherein said phosphor is calcium tungstate ($CaWO_4$), a niobium and/or rare earth activated or unactivated yttrium, lutetium, or gadolinium tantalates, a rare earth-activated or unactivated middle chalcogen phosphor, or a terbium-activated or unactivated lanthanum and lutetium middle chalcogen phosphor.

12. (original) The material of claim 11 wherein said phosphor is a rare earth oxychalcogenide and halide phosphor represented by the following Structure (I):

$$M'_{(w-n)}M''_nO_wX'$$

(I)

wherein M' is at least one of the metals yttrium (Y), lanthanum (La), gadolinium (Gd), or lutetium (Lm), M" is at least one of the rare earth metals dysprosium (Dy), erbium (Er), europium (Eu), holmium (Ho), neodymium (Nd), praseodymium (Pr), samarium (Sm), tantalum (Ta), terbium (Tb), thulium (Tm), or ytterbium (Yb), O is oxygen, X' is a middle chalcogen (S, Se, or Te) or halogen, n is 0.002 to 0.2, and w is 1 when X' is halogen or 2 when X' is a middle chalcogen.

13. (original) The material of claim 11 wherein said phosphor is the product of firing starting materials comprising optional oxide and a combination of species characterized by the following Structure (II):

$$MFX_{1-z}I_zuM^aX^a:yA:\ eQ:tD$$

(II)

wherein "M" is magnesium (Mg), calcium (Ca), strontium (Sr), or barium (Ba), "F" is fluoride, "X" is chloride (Cl) or bromide (Br), "I" is iodide, M^a is sodium (Na), potassium (K), rubidium (Rb), or cesium (Cs), X^a is fluoride (F), chloride (Cl), bromide (Br), or iodide (I), "A" is europium (Eu), cerium (Ce), samarium (Sm), or terbium (Tb), "Q" is BeO, MgO, CaO, SrO, BaO, ZnO, Al_2O_3, La_2O_3, In_2O_3, SiO_2, TiO_2, ZrO_2, GeO_2, SnO_2, Nb_2O_5, Ta_2O_5, or ThO_2, "D" is vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), or nickel (Ni), "z" is 0 to 1, "u" is from 0 to 1, "y" is from 1×10^{-4} to 0.1, "e" is from 0 to 1, and "t" is from 0 to 0.01.

14. (original) The material of claim 11 wherein said phosphor is a divalent alkaline earth metal fluorohalide phosphors characterized by the following Structure (III):

$$(Ba_{1-a-b-c}Mg_aCa_bSr_c)FX_{1-z}I_zrM^aX^a:yA$$

(III)

wherein "M" is magnesium (Mg), calcium (Ca), strontium (Sr), or barium (Ba), "F" is fluoride, "X" is chloride (Cl) or bromide (Br), "I" is iodide, M^a is sodium (Na), potassium (K), rubidium (Rb), or cesium (Cs), X^a is fluoride (F), chloride (Cl), bromide (Br), or iodide (I), "A" is europium (Eu), cerium (Ce), samarium (Sm), or terbium (Tb), "z" is 0 to 1, "y" is from 1×10^{-4} to 0.1, the sum of a, b and c is from 0 to 4, and r is from 10^{-6} to 0.1.

15. (original) The material of claim 1 wherein said photosensitive silver halide and said X-radiation-sensitive phosphor are in the same imaging layer.

16. (original) The material of claim 1 comprising the same or a different imaging layer(s) on both sides of said support.

17. (original) The material of claim 1 wherein said photosensitive silver halide has been chemically sensitized with a sulfur-containing chemical sensitizing compound, a tellurium-containing chemical sensitizing compound, or a gold(III)-containing chemical sensitizing compound, or mixtures of any of these chemical sensitizing agents.

18. (currently amended) An organic solvent-based X-radiation sensitive photothermographic material that comprises a support having on one side thereof, a photothermographic imaging layer comprising a hydrophobic binder and in reactive association:

a. a photosensitive silver bromide or silver iodide, or mixture thereof, that has been chemically sensitized with a sulfur-containing chemical sensitizing compound, a tellurium-containing chemical sensitizing compound, or a gold(III)-containing chemical sensitizing compound, or mixtures of any of these chemical sensitizing agents,

b. in reactive association with said photosensitive silver halide, a non-photosensitive source of reducible silver ions ~~can~~ comprises silver behenate,

c. a reducing agent for said reducible silver ions that comprises a hindered phenol,

d. one or more X-radiation-sensitive phosphors that are present in a total amount of from about 0.1 to about 20 mole per mole of total silver, the amount of total silver being from about 0.01 to about 0.05 mol/m^2, and

e. one or more of citric acid, tartaric acid, maleic acid, fumaric acid, citraconic acid, mesaconic acid, malonic acid, tricarballylic acid, 1,2,3,4-butanetetracarboxylic acid, 1,2,3,4-cyclopentanetetracarboxylic acid, 1,3,5-cyclohexanetricarboxylic acid, and 1,2-cyclohexanedicarboxylic acid in an amount of from about 0.001 to about 0.004 mol/mol of total silver.

19. (original) The material of claim 18 comprising citric acid, tricarballylic acid, 1,2,3,4-butanetetracarboxylic acid, 1,2,3,4-cyclopentanetetracarboxylic acid, or a mixture of these.

20. (original) The material of claim 18 having the same or different imaging layer(s) on both sides of said support.

21. (original) A method for forming a visible image comprising:

A) imagewise exposing any of the photothermographic materials of claim 1 to radiation to form a latent image, and

B) simultaneously or sequentially, heating the exposed photothermographic material to develop the latent image into a visible image.

22. (original) The method of claim 21 for providing a radiographic image of a human or animal subject.

23. (original) The method of claim 21 comprising using said visible image for a dental diagnosis.

24. (original) A method for forming a visible image comprising:

A) imagewise exposing the photothermographic material of Claim 18 to X-radiation to form a latent image, and

B) simultaneously or sequentially, heating said exposed photothermographic material to develop said latent image into a visible image.